

## 5.5.1 Office Equipment

Office equipment is the fastest-growing use of electricity in commercial buildings in the United States, accounting for 7% of all commercial-sector power consumption. We spend \$1.8 billion each year to operate office equipment in businesses and homes. ENERGY STAR® office equipment is widely available that provides users with dramatic savings compared with non-ENERGY STAR equipment—as much as 90% savings in some product areas. More than 3,300 office products are ENERGY STAR-labeled. Along with saving energy directly, this equipment can reduce air-conditioning loads, noise from fans and transformers, and electromagnetic field emissions from monitors.

### Opportunities

When new office equipment is purchased, be certain that the products are ENERGY STAR-compliant, as required by Executive Order 12845 (signed April 1993). Also, provide education about the use of office equipment for optimal energy efficiency as part of new-employee training, and send periodic reminders to employees—through e-mail or print newsletters and other in-house communication vehicles—about the use of equipment.

### Technical Information

#### COMPUTERS

**To save energy used by computers and monitors, buy ENERGY STAR-listed equipment** or consider laptop computers. ENERGY STAR computers must have a power-saving mode that powers down to no more than 15% of maximum power usage. ENERGY STAR monitors power down to 15 watts or less after 15–30 minutes of inactivity, and then down to 8 watts or less after about 70 minutes of inactivity.

**Laptop computers save even more energy** than ENERGY STAR-rated desktop computers/monitors. Laptops draw only 15–25 watts during use, compared to the 150 watts used by a conventional PC and monitor, and their sleep mode typically uses just a fraction of a watt. To maximize savings with a laptop, put the AC adapter on a power strip that can be turned off (or will turn off automatically)—the transformer in the AC adapter draws power continuously, even when the laptop is not plugged into the adapter.

**ENERGY STAR computers and monitors save energy only when the energy management features are activated.** ENERGY STAR products are shipped with energy-saving features activated. Employees should be able to adjust the energy-saving features to suit their particular needs and work habits (e.g., the length of time before power-down), but discouraged from deactivating those features.



Obtaining maximum energy savings from computers that are on networks can be difficult. There are many combinations of hardware, operating systems, applications software, and peripherals that may affect the sleep mode of computers. The “failure mode” for ENERGY STAR personal computers is for the computer to stay awake, or the network management staff may simply deactivate the power management system on the computer. In contemplating large purchases of PCs, first purchase a single machine to find out whether the power management works as designed with the network and software that will be used.

**The monitors must be capable of entering a low-power state.** Monitors must be capable of being shut off by a Display Power Monitoring Signal (DPMS) signaling protocol, by a software utility, or by a special plug connected to the PC. “Universal” monitors can both accept a DPMS from a PC and run power management from a non-DPMS PC.

**Screen savers do not save energy.** There is a common misconception that screen savers reduce energy use by monitors—they do not. Automatic switching to sleep mode or manually turning monitors off is always the better energy-saving strategy.

**Turn computers and monitors off at night, on weekends, and during the day when they are not in use.** Turning computers off saves more electricity than having them in sleep mode. A 150-watt PC and monitor will cost about \$105 per year to operate if left on continually. Turning it off at night and on weekends will save about \$80 per year in energy costs. Turning it off when not in use during the day can save another \$15 per year.



*ENERGY STAR-qualified office equipment switches to low-power modes after short periods of inactivity, thereby realizing significant energy savings compared with non-ENERGY STAR models.*

Photos: [www.officecopier.com](http://www.officecopier.com)

## PRINTERS/FACSIMILE MACHINES

**ENERGY STAR printers and fax machines power down** to a maximum of 15–45 watts, depending on the output speed (pages per minute), after a predetermined period of inactivity. Ink-jet and bubble-jet printers use significantly less electricity than laser models.

**Use a network or printer-sharing switch** rather than buying one printer per worker.

**Reduce printer use** by implementing paper reduction strategies, using duplex printing features (two-sided printing), and encouraging the use of e-mail.

**Consider new printers.** Although older ENERGY STAR printers required a delay time to return to print mode, newer models return to operating mode almost immediately from low-power mode.

**Use plain-paper fax machines to save money.** Thermal fax paper is not acceptable in typical paper recycling programs. For higher-usage offices, avoid fax machines that generate substantial waste by using a film cartridge.

**Use e-mail or direct computer faxing** instead of paper faxes whenever possible.

## COPIERS

**ENERGY STAR copiers must power down** to a low-power mode after 15 minutes of inactivity and an “off-mode” of lower power use (5–20 watts) after no more than 120 minutes of inactivity. Specific ENERGY STAR standards depend on the copier speed (copies per minute). The smallest copiers (less than 20 copies per minute) do not have the intermediate low-power mode and are preset to power down to an “off mode” of no more than 5 watts after 30 minutes of inactivity.

**Copiers use more energy** than any other piece of office equipment. Be sure to buy an ENERGY STAR copier that is sized correctly for the job.

**Purchase correctly sized copiers.** A mid-volume copier installed in a low-volume office can use 70% more energy per page than an efficient low-volume copier!

**Use e-mail,** Web sites, and “paperless faxing” when possible.

**Select double-sided copying,** an important energy- and paper-saving feature. Set copiers to automatically default to duplex copying.

**Purchase paper with a high recycled content.** At a minimum, use paper meeting the required recycled content for Federal purchasing—if possible, use higher-recycled-content paper.

**Copy in batches.** Significant reduction in energy consumption can be achieved by scheduling copier projects in batches so that the printer spends far less time in high-power mode.

## References

Tiller, D. K., and G. R. Newsham, “Switch Off Your Office Equipment and Save Money,” *IEEE Industry Applications Magazine*, 2(4), 1996, pp. 17–24.

## Contacts

Complete information on the ENERGY STAR program is available by calling the ENERGY STAR hotline at (888) STAR-YES or through the ENERGY STAR Web site at [www.epa.gov/energystar](http://www.epa.gov/energystar) or [www.energystar.gov](http://www.energystar.gov).

Lawrence Berkeley National Laboratory’s Web site includes a list of resources on reducing office equipment energy use: [eetd.LBL.gov/BEA/SF/](http://eetd.LBL.gov/BEA/SF/).